

1. A compound having the anti-receptor internal image antibody conjugates of formula 1,



- wherein Ab is a whole or fragmented internal image antibody to a receptor
- 5 selected from the group consisting of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin; L is a linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, -CONH-, -S(CH₂)_mCONH-, and -S-(N-succinimido)-(CH₂)_nCONH- where m and n vary from 1 to 10; and Dye is a
- 10 chromophore or a fluorophore selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenoxazines, phenothiazines, phenoselenazines, fluoresceins, porphyrins, benzoporphyrins, squaraines, corrins, croconiums, azo compounds, methine dyes, and indolenium dyes.
2. The compound of Claim 1 wherein Ab is to a steroid receptor; L is a linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- where n varies from 1 to 6, and Dye is an
- 5 aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

3. The compound of Claim 1 wherein Ab is to a cardiac glycoside receptor; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6, and Dye is an aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.
4. The compound of Claim 1 wherein Ab is to a somatostatin receptor; L is a linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6, and Dye is an aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.
5. The compound of Claim 1 wherein Ab is to a bombesin receptor; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6, and Dye is an aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

6. The compound of Claim 1 wherein Ab is to a cholecystokinen receptor; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6, and Dye is an aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.
7. The compound of Claim 1 wherein Ab is to a neurotensin receptor; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6, and Dye is an aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.
8. The compound of Claim 1 wherein Ab is to a heat sensitive bacterioendotoxin receptor; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6, and Dye is an aromatic or a heteroaromatic radical selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

9. A method of diagnosing a patient using an internal imaging antibody comprising:

- 5 (a) selecting a ligand that binds to a biological receptor selected from the group comprising of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinin, neurotensin, and heat sensitive bacterioendotoxin;
- 10 (b) preparing a first generation antigen of the receptor binding ligand;
- (c) preparing a first generation of monoclonal antibodies against the first generation antigen and isolating monoclonal antibodies directed to the receptor binding ligands;
- 15 (d) preparing monoclonal anti-idiotypic antibodies against the first generation antibodies and isolating the internal image anti-receptor antibodies from said anti-idiotypic antibodies;
- (e) conjugating said internal image anti-receptor antibodies to a photoactive molecule;
- 20 (f) administering an effective concentration of the internal image antibody conjugate in step (e) to a patient and allowing the conjugate to accumulate at a target site within the patient; and
- (g) exposing said target site with light sufficient to activate the photoactive molecule and imaging target site.

10. The method of Claim 9, wherein said receptor-binding ligand is selected from the group consisting of drugs, hormones, peptides, carbohydrates, nucleosides, peptidomimetic, glycomimetics, and biosynthetic intermediates.

11. The method of Claim 9, wherein said photoactive molecule is a dye selected from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenoxazines, phenothiazines, phenoselenazines, fluoresceins, porphyrins, benzoporphyrins, squaraines, corrins, croconiums, azo compounds, methine dyes, and indolenium.

12. The method of Claim 9, wherein said effective concentration of the internal image antibody conjugate ranges from about 0.1 mg/kg body weight to about 500 mg/kg body weight.

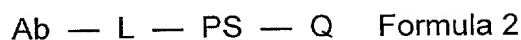
13. The method of Claim 9, wherein the effective concentration of the internal image antibody conjugate ranges from about 0.5 mg/kg body weight to about 2 mg/kg body weight.

14. The method of Claim 9, wherein said imaging target site is selected from the group consisting of absorbance, fluorescence and scattering methods.

15. The method of Claim 9, wherein said target site is selected from the group consisting of tumors, lesions, necrotic regions, ischemic regions, thrombic regions, inflammatory regions, impaired vasculature, and combinations thereof.

TECHNICAL FIELD

16. A compound having the anti-receptor internal image antibody conjugates of formula 2



wherein Ab is a whole or fragmented internal image antibody to a receptor

- 5 selected from the group consisting of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin; L is a linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, -CONH-, -S(CH₂)_mCONH-, and -S-(N-succinimido)-(CH₂)_nCONH- where m and n vary from 1 to 10; PS is
- 10 photosensitizing aromatic or a heteroaromatic radical selected from the group consisting of benzenes, polyfluorobenzenes, naphthalenes, naphthoquinones, anthracenes, anthraquinones, phenanthrenes, tetracenes, naphthacenediones, pyridines, quinolines, isoquinolines, indoles, isoindoles, pyrroles, imidiazoles, pyrazoles, pyrazines, purines, benzimidazoles, benzofurans, dibenzofurans,
- 15 carbazoles, acridines, acridones, phenanthridines, thiophenes, benzothiophenes, dibenzothiophenes, xanthenes, xanthonenes, flavones, coumarins, and anthacylines; and Q is a precursor for producing reactive intermediates selected from the group consisting of free radicals, nitrenes, and carbenes.

17. The compound of claim 16 wherein the reactive intermediates are selected from the group consisting of azides (-N₃), cyclic azo compounds (-N=N-), and sulfenates (-O-S-).

18. The compound of Claim 16 wherein Ab is to a steroid receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- where n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

19. The compound of Claim 16 wherein Ab is to a cardiac glycoside receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- where n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

20. The compound of Claim 16 wherein Ab is to a somatostatin receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- where m and n vary from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

21. The compound of Claim 16 wherein Ab is to a bombesin receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- where n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

22. The compound of Claim 16 wherein Ab is to a cholecystokinen receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- where n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

23. The compound of Claim 16 wherein Ab is to a neurotensin receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- where n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

24. The compound of Claim 16 wherein Ab is to a heat sensitive bacterioendotoxin receptor; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of -HNCONH-,
5 -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- where n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

25. A method of performing a therapeutic procedure in a patient using an internal imaging antibody comprising:

- 5 (a) selecting a ligand that binds to a biological receptor selected from the group comprising of steroid, cardiac glycoside, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin;
- 10 (b) preparing a first generation antigen of the receptor-binding ligand;
- (c) preparing first generation of monoclonal antibodies against the first generation antigen and isolating monoclonal antibodies directed to the receptor-binding ligands;
- 15 (d) preparing monoclonal anti-idiotypic antibodies against the first generation antibodies and isolating the internal image anti-receptor antibodies from said anti-idiotypic antibodies;
- (e) conjugating said internal image anti-receptor antibodies to a photoactive molecule and a precursor;
- 20 (f) administering an effective concentration of the internal image antibody conjugate in step (e) to a patient and allowing the conjugate to accumulate at a target site; and
- (g) exposing said target site with light sufficient to activate the photosensitizer and induce treatment of the impaired tissues.

26. The method of Claim 25 wherein said receptor-binding ligand is selected from the group consisting of drugs, hormones, peptides, carbohydrates, nucleosides, peptidomimetics, glycomimetics, and biosynthetic intermediates.

27. The method of Claim 25 wherein said photoactive molecule is selected from the group consisting of a photosensitizer, a precursor for producing reactive intermediates, and combinations thereof.

28. The method of Claim 27 wherein said photosensitizer is selected from the group consisting of benzenes, polyfluorobenzenes, naphthalenes, naphthoquinones, anthracenes, anthraquinones, phenanthrenes, tetracenes, naphthacenediones, pyridines, quinolines, isoquinolines, indoles, isoindoles, 5 pyrroles, imidazoles, pyrazoles, pyrazines, purines, benzimidazoles, benzofurans, dibenzofurans, carbazoles, acridines, acridones, phenanthridines, thiophenes, benzothiophenes, dibenzothiophenes, xanthenes, xanthonenes, flavones, coumarins, and anthacyclines.

29. The method of Claim 27 wherein said precursor is selected from the group consisting of azides ($-N_3$), cyclic azo compounds ($-N=N-$), and sulfenates ($-O-S-$).

30. The method of Claim 25 wherein said effective concentration of the internal image antibody conjugate ranges from about 0.1 mg/kg body weight to about 500 mg/kg body weight.

31. The method of Claim 25 wherein the effective concentration of the internal image antibody conjugate ranges from about 0.5 mg/kg body weight to about 2 mg/kg body weight.

32. The method of Claim 25 wherein said target site is selected from the group consisting of tumors, lesions, necrotic regions, ischemic regions, thrombic regions, inflammatory regions, impaired vasculature, and combinations thereof.

for use in

33. A photodiagnostic composition having formula 1,



wherein Ab is a whole or fragmented internal image antibody to a biological receptor selected from the group consisting of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin and dye is a photoactive dye.

34. The composition of claim 33 wherein the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenoxazines, phenothiazines, phenoselenazines, fluoresceins, porphyrins, benzoporphyrins, squaraines, corrins, croconiums, azo compounds, methine dyes, and indolenium dyes.

35. The composition of claim 33 further comprising a linker L linking Ab and Dye.

36. The composition of claim 35 wherein L is selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, -CONH-, -S(CH₂)_mCONH-, and -S-(N-succinimido)-(CH₂)_nCONH-, and wherein m and n are from 1 to 10.

37. The composition of Claim 35 wherein Ab is directed at steroid receptors; L is a linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n is from 1 to 6; the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

38. The composition of Claim 35 wherein Ab is directed at cardiac glycoside receptors; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

39. The composition of Claim 35 wherein Ab is directed at somatostatin receptors; L is a linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

40. The composition of Claim 35 wherein Ab is directed at bombesin receptors; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

41. The composition of Claim 35 wherein Ab is directed at CCK receptors; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

42. The composition of Claim 35 wherein Ab is directed at neurotensin receptors; L is linker selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; the dye is an aromatic or a heteroaromatic radical derived from the group consisting of cyanines, indocyanines, phthalocyanines, rhodamines, phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

43. The composition of Claim 35 wherein Ab is directed at ST receptors;

L is linker selected from the group consisting of -HNCONH-, -HNCSNH-,

-HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; the

dye is an aromatic or a heteroaromatic radical derived from the group

5 consisting of cyanines, indocyanines, phthalocyanines, rhodamines,

phenothiazines, fluoresceins, porphyrins, corrins, and azo compounds.

44. A method of diagnosing a condition at a body region in a patient comprising:

administering to said patient a photodiagnostic composition comprising an internal image antibody to a biological receptor conjugated to a photosensitive dye at a dose effective for photodiagnosis;

accumulating said photodiagnostic composition at said body region to be diagnosed;

thereafter providing light sufficient to activate said photosensitive dye in said body region; and

imaging said body region to diagnose a condition in said patient.

45. The method of claim 44 wherein said antibody is directed to a receptor selected from the group consisting of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin.

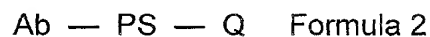
46. The method of claim 44 wherein light is provided at a wavelength in the range of about 300 to 1200 nm.

47. The method of claim 44 wherein said imaging is by a method selected from the group consisting of absorbance, fluorescence, scattering, and combinations thereof.

48. The method of claim 44 wherein said effective dose is in the range of about 0.1 mg/kg to about 500 mg/kg body weight.

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49. A therapeutic composition having formula 2,



wherein Ab is a whole or fragmented internal image antibody to a biological receptor; PS is a photosensitizer; and Q is a precursor.

50. The composition of claim 49 wherein the receptor is for a compound selected from the group consisting of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin.

51. The composition of claim 49 further comprising a linker L linking Ab and PS.

52. The composition of claim 51 wherein L is selected from the group consisting of -HNCONH-, -HNCSNH-, -HNCO-, -CONH-, -S(CH₂)_mCONH-, and -S-(N-succinimido)-(CH₂)_nCONH-; and m and n vary from 1 to 10.

53. The composition of claim 49 wherein the photosensitizer is a photosensitizing aromatic or a heteroaromatic radical derived from the group consisting of benzenes, polyfluorobenzenes, naphthalenes, naphthoquinones, anthracenes, anthraquinones, phenanthrenes, tetracenes, naphthacenediones, pyridines, quinolines, isoquinolines, indoles, isoindoles, pyrroles, imidazoles, pyrazoles, pyrazines, purines, benzimidazoles, benzofurans, dibenzofurans, carbazoles, acridines, acridones, phenanthridines, thiophenes, benzothiophenes, dibenzothiophenes, xanthenes, xanthonenes, flavones, coumarins, and anthacylines.
54. The composition of claim 49 wherein the precursor is for producing reactive intermediates such as free radicals, nitrenes, carbenes, and the like and is selected from the group consisting of azides ($-N_3$), cyclic azo compounds ($-N=N-$), and sulfenates ($-O-S-$).
55. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of steroids; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthonenes, anthraquinones, acridines, and acridones; L is a linker selected from the group consisting of $-HNCONH-$, $-HNCO-$, and $-S-(N\text{-succinimido})-(CH_2)_nCONH-$ and n varies from 1 to 6; and Q is selected from the group consisting of azides ($-N_3$), cyclic azo compounds, and sulfenates ($-O-S-$).

56. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of cardiac glycosides; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker unit selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-
5 (CH₂)_nCONH- and n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃) and sulfenates (-O-S-).

57. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of somatostatin; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker unit selected from the
5 group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and m and n vary from 1 to 6; and Q is selected from the group consisting of azides (-N₃), cyclic azo compounds and sulfenates (-O-S-).

58. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of bombesin; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker unit selected from the
5 group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃), and sulfenates (-O-S-).

59. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of CCK; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker unit selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃), and sulfenates (-O-S-).

60. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of neurotensin; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker unit selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃), and sulfenates (-O-S-).

61. The composition of Claim 51, wherein Ab is directed at the biological receptor selected from the group consisting of ST; PS is selected from the group consisting of tetrafluorobenzenes, phenanthridines, xanthenes, anthraquinones, acridines, and acridones; L is a linker unit selected from the group consisting of -HNCONH-, -HNCO-, and -S-(N-succinimido)-(CH₂)_nCONH- and n varies from 1 to 6; and Q is selected from the group consisting of azides (-N₃), and sulfenates (-O-S-).

62. A method of performing a therapeutic procedure for a pathological condition at a body region in a patient comprising:

- administering to said patient a phototherapeutic composition comprising an internal image antibody to a biological receptor at a dose effective for phototherapy conjugated to a photosensitizer and a precursor for producing reactive intermediates;
- accumulating said phototherapeutic composition at said body region to be treated; and
- thereafter providing light sufficient to activate said precursor and said photosensitizer in said body region to treat said patient.

63. The method of claim 62 wherein said antibody is directed to a receptor selected from the group consisting of steroids, cardiac glycosides, somatostatin, bombesin, cholecystokinen, neurotensin, and heat sensitive bacterioendotoxin.

64. The method of claim 62 wherein light is provided at a wavelength in the range of about 300 to 1200 nm.

65. The method of claim 62 wherein said effective dose is in the range of about 0.1 mg/kg to about 500 mg/kg body weight.

66. The method of claim 62 wherein said therapeutic procedure is selected from the group consisting of treating ischemia, treating impaired vasculature, treating a thrombus, inducing necrosis, inducing apoptosis, and combination thereof.

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